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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/529,242

03/25/2005

Stephen Christopher Neil Brown

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SUITE 105
ALEXANDRIA, VA 22314

EXAMINER

EMPIE, NATHAN H

ART UNIT

PAPER NUMBER

1709

MAIL DATE

DELIVERY MODE

05/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/529,242

Applicant(s)

BROWN ET AL.

Examiner

Nathan H. Empie

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1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 7/12/05.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

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DETAILED ACTION

Examiner acknowledges receipt of 03/25/2005 preliminary amendment to the specification and claims, which were entered into the file. Claims 29-45 are currently pending.

Specification

The disclosure is objected to because of the following informalities: the term adsorbed/adsorb/adsorption/adsorbent/adsorbs in [0011, 0014, 0022, 0026, 0040, 0058, 0060, 0063, 0065, 0067, 0068] are being examined as absorbed/absorb/absorption/absorbent/absorbs respectively because light is commonly known to be absorbed by materials, not trapped along a materials surface. Appropriate correction is required.

Claim Objections

Claims 31, 37, and 43 are objected to because of the following informalities: the term adsorbs/adsorbing are being examined as absorbs/absorbing respectively because light is commonly known to be absorbed by materials, not trapped along a materials surface. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 29-33, and 36-44 are rejected under 35 U.S.C. 102(b) as being anticipated by Khoobehi et al. (US patent 5,376,086, hereafter '086).

'086 teaches a method of removing a portion of a surface (cornea, col 2 lines 25-34), the method comprising providing a beam of laser light (Fig 1 (11), col 5, lines 13-20);

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irradiating a location of the surface (12) with the laser light (col 5, lines 21-35);

wherein a mask means (14-16) is used to remove a low power density part of the laser beam that is below a threshold power density for surface removal before the surface location is irradiated (Fig 1, col 2 lines 25-35, Fig 13, col 7 lines 1-29).

Claim 30: '086 teaches the method of removing a portion of a surface according to claim 29 (above) wherein the mask means is a shadow mask (14-16, col 5 lines 29-35).

Claim 31: '086 teaches the method of removing a portion of a surface according to claim 30 (above) wherein the shadow mask absorbs substantially all of that portion of the laser beam that is below the threshold power density (col 2 lines 35-50).

Claim 32: '086 teaches the method of removing a portion of a surface according to claim 29 (above) wherein the mask means is a reflective mask wherein light incident on the mask is reflected by the mask (col 3, lines 18-57).

Claim 33: '086 teaches the method of removing a portion of a surface according to claim 32 (above) wherein the reflection redirects low power density laser light to another low power density portion of the laser beam to create an additional high power density portion of the laser beam (col 2 lines 44-50).

Claim 36. An apparatus for removing a portion of a surface (12) by irradiation with laser light (11) (col 5 lines 4-20) and Fig 1),

the apparatus comprising a laser source for producing a laser beam (11) for irradiating a location on the surface (12);

and a mask means (14-16) to remove a lower power density part of the laser beam (col 2 lines 25-43).

Claim 37: '086 teaches the apparatus according to claim 36 (above) wherein the mask means is a shadow mask (14-16) that absorbs 'low intensity' radiation (col 2 lines 35-50).

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Claim 38: '086 teaches the apparatus according to claim 36 (above) wherein the mask means is a reflective mask (Fig. 6, 41) (col 6, lines 34-40) that redirects at least a part of the 'low intensity' portion of the radiation (col 2 lines 43-50).

Claim 39: '086 teaches the apparatus according to claim 36 (above) wherein the mask means (14-16) is provided with an aperture (holes or openings) and wherein a high power density part of a laser beam passes through the aperture (col 5 lines 28-31).

Claim 40: '086 teaches the apparatus according to claim 36 (above) wherein the mask means is tubular (holes or openings of mask, 14-16, Fig 1).

Claim 41: '086 teaches the apparatus according to claim 36 (above) wherein the mask means comprises a metal or a ceramic (preferably fused silica, col 3 lines 5-10).

Claim 42: '086 teaches the apparatus according to claim 36 (above) wherein the mask means is coated (col 3, lines 18-28).

Claim 43: '086 teaches the apparatus according to claim 42 (above) wherein the coating is a light-absorbing coating (col 3, lines 29-31).

Claim 44: '086 teaches the apparatus according to claim 42 (above) wherein the coating is a reflective coating (col 3, lines 29-31).

Claims 29, 32, 33, 36, 38, 40, and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Neiheisel (US patent 5,736,709, hereafter '709).

'709 teaches a method of removing a portion of a surface (oxide layer, abstract, col 2 line 65- col 3 line 5),

the method comprising providing a beam of laser light (Fig 2 (54), (56), col 6, lines 37-67);

irradiating a location of the surface (38) with the laser light ((Fig 5-8) col 11, lines 24-27);

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wherein a mask means (68) is used to remove a low power density part of the laser beam that is below a threshold power density for surface removal before the surface location is irradiated (Fig 3, conversion of profile 58 to 64, col 10 lines 47-67).

Claim 32: '709 teaches the method of removing a portion of a surface according to claim 29 (above) wherein the mask means is a reflective mask (68, step index optical fiber), wherein light incident on the mask is reflected (multiple internal reflections) by the mask (col 10, lines 47-67).

Claim 33: '709 teaches the method of removing a portion of a surface according to claim 32 (above) wherein the reflection redirects low power density laser light to another low power density portion of the laser beam to create an additional high power density portion of the laser beam (Fig 3, conversion of profile 58 to 64, col 10 lines 47-67).

Claim 36. '709 teaches an apparatus for removing a portion of a surface (38) by irradiation with laser light (56, 62, 32)(Fig 5-8, abstract, col 2 line 65- col 3 line 5);

the apparatus comprising a laser source (54) for producing a laser beam (56) for irradiating a location on the surface (38) (Fig 5-8) col 11, lines 24-27);

and a mask means (68) to remove a lower power density part of the laser beam (Fig 3, conversion of profile 58 to 64, col 10 lines 47-67).

Claim 38: '709 teaches the apparatus according to claim 36 (above) wherein the mask means is a reflective mask (68, multiple internal reflections) that redirects at least a part of the 'low intensity' portion of the radiation (Fig 3, conversion of profile 58 to 64, col 10 lines 47-67).

Claim 40: '709 teaches the apparatus according to claim 36 (above) wherein the mask means (68) is tubular (optical fiber, Fig 3, col 10 lines 47-67).

Claim 41: '709 teaches the apparatus according to claim 36 (above) wherein the mask means (68) comprises a metal or a ceramic (step-index optical fiber, col 3 lines 5-10).

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 29, 34, 35, 36, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (EP 653762 A1, hereafter '762) in view of Ngoi et al. (US patent 6,285,002, hereafter '002).

'762 teaches a method of removing a portion of a surface (12) (Abstract, Col 5 line 57 –Col 6 line 8 Fig 1),

the method comprising providing a beam of laser light (14) (Fig 1);

irradiating a location of the surface (12) with the laser light (14) (Fig 1);

'762 does not teach a mask means is used to remove a low power density part of the laser beam that is below a threshold power density for surface removal before the surface location is irradiated. '002 teaches a mask means (diaphragm (5), Fig 1) is used to remove a low power density part of the laser beam that is below a threshold power density for surface removal before the surface location is irradiated (col 5 lines 32-39). '002 teaches a laser micro machining method where the incorporation of a diaphragm enhances the beam quality by eliminating the peripheral portion of the laser beam (col 5 lines 32-39). Since '762 teaches a method of laser machining a surface, it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated the diaphragm of '002 into the method described by '762, to enhance the resulting laser beam quality.

Claim 34: '762 in further view of '002 teach the method of removing a portion of a surface according to claim 29 (above) wherein '762 teaches the surface is a concrete surface contaminated with radionuclides (Abstract, col 1 lines 1-22).

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Claim 35: '762 in further view of '002 teach the method of removing a portion of a surface according to claim 29 (above) wherein '762 teaches the surface portion is removed by the effects of thermal shock (col 2 line 57 – col 3 line16).

Claim 36. '762 teaches an apparatus for removing a portion of a surface (12) by irradiation with laser light (14) (col 5 line 57 –col 6 line 8 Fig 1),

the apparatus comprising a laser source (col 2 lines 33-40) for producing a laser beam (14) for irradiating a location on the surface (12);

'762 does not teach a mask means to remove a lower power density part of the laser beam. '002 teaches a mask means (5) to remove a low power density part of the laser beam (col 5 lines 32-39). '002 teaches a laser micro machining apparatus where the incorporation of a diaphragm enhances the beam quality by eliminating the peripheral portion of the laser beam (col 5 lines 32-39). It would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated the diaphragm of '002 into the apparatus described by '762 to enhance the resulting laser beam quality.

Claim 45: '762 in further view of '002 teaches the apparatus according to claim 36 (above) wherein '762 teaches that the laser source is an Yttrium Aluminum Garnet (YAG) laser (col 2 lines 38-40).

Conclusion


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure include: US6327875B1, US6178045B1, US2002/0023903A1 as they describe art where masks are incorporated into laser beam paths.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan H. Empie whose telephone number is (571) 270-1886. The examiner can normally be reached on M-F, 7:30- 5:00 EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on (571) 272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


MICHAEL B. CLEVELAND
SUPERVISORY PATENT EXAMINER

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